

Application No. 10/753,269

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AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A method of modifying a substrate comprising the steps of:

- (i) providing a substrate comprising a base and a first metal deposited on at least a portion of the base;
- (ii) providing a polishing pad;
- (iii) providing a first chemical-mechanical polishing composition;
- (iv) applying the first chemical-mechanical polishing composition to at least a portion of the substrate between the substrate and the polishing pad;
- (v) contacting at least a portion of the substrate with the polishing pad;
- (vi) moving the polishing pad relative to the substrate to polish at least a portion of the substrate until dishing occurs with respect to the first metal; and
- (vii) depositing a second metal onto the substrate at a rate of about 400 Å per minute or more to form a modified substrate.

2. (Original) The method of claim 1, wherein the deposition of the second metal is electroless deposition.

3. (Original) The method of claim 2, wherein the second metal is the same as the first metal.

4. (Original) The method of claim 3, wherein the method further comprises the steps of:

- (viii) providing a second chemical-mechanical polishing composition;
- (ix) applying the second chemical-mechanical polishing composition to at least a portion of the modified substrate between the modified substrate and the polishing pad;
- (x) contacting at least a portion of the modified substrate with the polishing pad; and
- (xi) moving the polishing pad relative to the modified substrate to polish at least a portion of the modified substrate.

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5. (Original) The method of claim 3, wherein the first and second metals comprise copper, platinum, ruthenium, iridium, gold, nickel, cobalt, or combinations thereof.

6. (Original) The method of claim 5, wherein the first and second metals are copper.

7. (Cancelled)

8. (Currently Amended) The method of claim 7 1, wherein the moving of the polishing pad relative to the substrate is continued until dishing of about 400 Å or more occurs with respect to the first metal.

9. (Original) The method of claim 8, wherein the moving of the polishing pad relative to the substrate is continued until dishing of about 1000 Å or more occurs with respect to the first metal.

10. (Original) The method of claim 4, wherein the substrate comprises silicon or an interlevel dielectric.

11. (Original) The method of claim 4, wherein the moving of the polishing pad relative to the substrate is performed at a first rotational speed, the moving of the polishing pad relative to the modified substrate is performed at a second rotational speed, and the first rotational speed is greater than the second rotational speed.

12. (Original) The method of claim 4, wherein the electroless deposition comprises the application of a deposition solution to the substrate.

13. (Original) The method of claim 12, wherein the deposition solution comprises (a) a reducing agent, (b) a metal complexing agent or a metal chelating agent, (c) a metal ion, and (d) a pH modifying reagent.

14. (Original) The method of claim 13, wherein the metal complexing agent is a carboxylic acid, nitrogen-containing compound, or phosphorous-containing compound.

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15. (Original) The method of claim 12, wherein the deposition solution comprises CuSO₄, HCHO, KOH, and EDTA.

16. (Original) The method of claim 4, wherein the electroless deposition is performed at a pH of about 7 or more.

17. (Original) The method of claim 4, wherein the electroless deposition is performed for about five minutes or less.

18. (Original) The method of claim 17, wherein the electroless deposition is performed for about two minutes or less.

19. (Original) The method of claim 4, wherein the depositing of the second metal onto the substrate by electroless deposition is performed at a rate of about 500 Å per minute or more.

20. (Original) The method of claim 4, wherein the depositing of the second metal onto the substrate is performed while the polishing pad is contacting at least a portion of the substrate.

21. (Original) The method of claim 20, wherein the depositing of the second metal onto the substrate is performed while the polishing pad is moving relative to the substrate.

22. (Original) The method of claim 1, wherein the first chemical-mechanical polishing composition is an electrochemical-mechanical polishing composition.

23. (Original) The method of claim 3, wherein the second chemical-mechanical polishing composition is an electrochemical-mechanical polishing composition.

24. (Original) The method of claim 4, wherein the substrate comprises a layer of a barrier material that is on the base and partially exposed on the surface of the base and partially disposed between the first metal and the base.

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25. (Original) The method of claim 24, wherein the polishing of the substrate does not substantially remove the layer of the barrier material, and wherein the polishing of the modified substrate removes at least a portion of the second metal and the barrier material exposed on the base that is not between the first metal and the base.

26. (Original) The method of claim 25, wherein the barrier material comprises tantalum, tantalum alloys, tantalum nitride, titanium, titanium alloys, titanium nitride, tungsten, tungsten alloys, or tungsten nitride.

27. (Original) The method of claim 2, wherein the electroless deposition is performed at a temperature of about 30-80° C.

28. (Original) The method of claim 27, wherein the electroless deposition is performed at a temperature of about 45-55° C.